APRIL/MAY 2024

DCH42/GCH42 — PHYSICAL CHEMISTRY – IV

Time : Three hours Maximum : 75 marks

Shanmuga Industries Arts & Science College T.V.Malai

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. Define intersystem crossing.
2. Classify the difference between fluorescence and phosphorescence.
3. Comment on the quantum yield of a photochemical chain reactions.
4. Tell the principle of photovoltaic cells.
5. Define Compton effect.
6. List the quantum mechanical postulates.
7. Relate the principle of BO approximation.
8. Define the need of approximation methods.
9. Differentiate partition functions.
10. What are open systems give example?

SECTION B — (5 × 5 = 25 marks)

Answer ALL the questions.

11. (a) Comment on the classification of excimer and exciplexes.

Or

(b) Draw Jablonski diagram

12. (a) Demonstrate any one experiment for quantum yield measurement.

Or

(b) Explain the uses of photo electrochemical cells.

13. (a) Write about the operator concept in quantum mechanics.

Or

(b) Illustrate the principle of Eigen equations with example.

14. (a) Distinguish the principle of perturbation method.

Or

(b) Write the applications of Huckel theory with example.

15. (a) Write short note on Einstein model.

Or

(b) Explain the applications phenomenological equations.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Derive Stern Volmer equation.

17. Explain various methods of photochemical water splitting reactions.

18. Evaluate the application of Schrodinger equation to a particle in ID box.

19. Elaborate the applications of LCAO-MO theory.

20. Justify the role of statistical thermodynamics in heat capacity of solids.

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